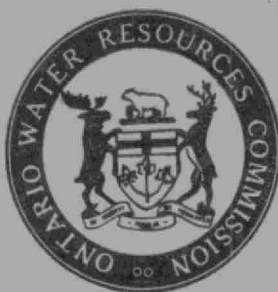




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THE  
ONTARIO WATER RESOURCES  
COMMISSION  
WATER POLLUTION SURVEY  
of the  
POLICE VILLAGE OF MERLIN  
in the  
COUNTY OF KENT

1968

TD  
380  
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1967  
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Report on a water pollution  
survey of the police village of  
Merlin, townships of Raleigh &  
Tilbury East, county of Kent.

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REPORT

ON A

WATER POLLUTION SURVEY

OF THE

POLICE VILLAGE OF MERLIN

TOWNSHIPS OF RALEIGH & TILBURY EAST

COUNTY OF KENT

1967

DISTRICT ENGINEERS BRANCH

DIVISION OF SANITARY ENGINEERING

# ONTARIO WATER RESOURCES COMMISSION

## REPORT

### INTRODUCTION

A water pollution survey of the Police Village of Merlin was performed in the Summer of 1967. Surveys of this nature are conducted on a routine basis by the Ontario Water Resources Commission for the purpose of locating and recording sources of existing and potential pollution to watercourses. Enquiries and investigations are made with respect to drains which discharge to local watercourses and samples are collected to determine the significance of the drain discharges and their effects on the receiving streams. Where pollution sources are noted, recommendations are made concerning their abatement.

### GENERAL

#### Location

Merlin, with an assessed population of 639 (1967 Municipal Directory) is situated on Highway #98 in the South-western section of the County of Kent. Part of the village is in the Township of Raleigh and part in the Township of Tilbury East.

#### Drainage

General drainage for the area is provided by several local storm sewers and open surface water drainage ditches. Drainage direction is towards the north with discharge into upper reaches of the Jeannette Creek watercourse.

Local drainage for the south-west section of the Village is provided by the Smith Drain which starts in the Township of Tilbury East, south of the Pere Marquette Railway. Drains on each side of the Townline Road provide local drainage for the central sections of Merlin. Drainage for the eastern section is provided by local surface water drains which discharge to a municipal drain on the east side of the police village.

#### WATER SUPPLY

The Police Village of Merlin does not have a communal water works system. Water supplies are obtained from individual wells.

#### WATER POLLUTION CONTROL

##### Sewage Treatment Facilities

Septic tank systems are utilized on most properties for the treatment of sanitary sewage and domestic wastes. A few privies are also being used.

Clay soil conditions with poor absorption qualities tend to result in unsatisfactory operation of field-tile disposal beds on many properties. The lack of space for the installation of adequate field-tile disposal beds is quite evident on many residential and commercial properties. These conditions have resulted in the discharging of inadequately treated sanitary sewage into the local surface water drainage system.

### REFUSE DISPOSAL

Refuse from the Police Village of Merlin is disposed of at two separate township sites.

Part of the Village (area west of Townline Road) utilizes the Township of Tilbury East refuse disposal site which is located approximately six miles west of Merlin on Lot 13, Concession 9.

The eastern area of Merlin disposes of its refuse at the Township of Raleigh site, approximately four miles north of the village on Lot 7, Concession 8.

The mode of operation at both refuse disposal areas includes trenching, dumping and covering. The sites appear to be well operated and no pollution problems, attributed to the operation of the sites, are anticipated for the present.

### SAMPLING PROCEDURES

Water samples were collected, where possible, from representative points in the Police Village of Merlin and near its outskirts. These samples were then submitted to the regional OWRC laboratory in London Ontario for sanitary chemical analyses and bacteriological examination. The laboratory analyses results were then tabulated and appended to this report (Table I).

The locations of sampling points were plotted on the accompanying map.

## INTERPRETATION AND SIGNIFICANCE OF LABORATORY RESULTS

### Bacteriological Examination

The membrane filter (MF) technique is employed at OWRC Laboratories to obtain a direct enumeration of coliform organisms and is reported per 100 millilitres (ml) of the sample.

The presence of coliforms may indicate pollution from both faecal and non-faecal sources while E.coli organisms indicate pollution of intestinal origin only. The maximum limit of 2,400 coliform organisms per 100 millilitres is the objective for bacteriological quality of surface water in Ontario.

### SANITARY CHEMICAL ANALYSES

#### Biochemical Oxygen Demand (BOD)

The BOD of sewage or polluted waters is the oxygen required during stabilization of the decomposable organic material by aerobic biochemical action. A five-day BOD determination with incubation at 20 degrees Centigrade is reported. A high BOD is indicative of organic or chemical pollution. A desirable upper limit in surface water is four (4) parts per million (ppm) while the objective maximum in waste discharges to a watercourse is 15 ppm.

#### Solids

The value for total solids expressed in parts per million (ppm) is the sum of the values for the suspended and dissolved matter in water. The concentration of suspended solids which indicates the measure of undissolved solids of organic or inorganic



nature is generally the most significant of the solids analyses in regard to surface water quality. The effects of suspended solids in water are reflected in difficulties associated with water purification, deposition in streams, and injury to the habitat of fish. The OWRC's objective for discharge, is a suspended solids concentration of not greater than 15 ppm.

Alkyl Benzene Sulfonate (ABS)  
(Anionic Surfactant)

The surfactant is a synthetic organic chemical which is used as a principal ingredient of modern household detergents. The popular use of synthetic detergents for general cleaning purposes has resulted in the incidence of residual ABS in waste discharges. Therefore the presence of detergents in water samples is usually an indication of pollution from domestic sources.

SIGNIFICANCE OF ANALYSES RESULTS

The appended laboratory results indicate that extremely high levels of pollution were evident in all of the surface water drains examined. Sanitary chemical analyses revealed excessive BOD, suspended solids and ABS concentrations in most of the samples tested. Bacteriological examinations disclosed extremely high coliform counts in all samples. These excessively high values are indications of pollution of a domestic nature.

Since the general drainage in the Merlin area is in a northerly direction, analyses results of samples collected both upstream and downstream of the community indicate that the pollution

was originating in Merlin and flowing towards the adjacent water-courses, in concentrations greatly in excess of OWRC objectives for surface water drainage. In some cases, particularly at the open ditches where samples (2) and (3) were collected, septic conditions were observed and offensive odours emanating from the drain waters were noted. Not only is this aesthetically unpleasing, but it is also a hazard to public health.

#### SUMMARY AND CONCLUSIONS

This is a report of a water pollution survey of the Police Village of Merlin, the purpose of which was to locate existing and potential sources of water pollution in the community. The survey was conducted in the summer of 1967 and the report is based on the results of chemical analyses and bacteriological examinations of water samples collected at that time.

It was indicated that the storm and surface water drains in Merlin were grossly polluted and that this pollution was of a domestic nature originating from inadequate septic tank systems in the municipality. Heavy clay soil conditions which greatly impair the efficiency of field tile disposal beds and lot size limitations, have led to the direct discharge of effluent from many of the septic tank systems to the municipal storm and surface water drains. Correction of these conditions on an individual basis would probably prove to be ineffective and impractical because of the above mentioned

soil conditions and small lot sizes. It appears therefore, that the provision of a communal type sewage works would be necessary to solve the pollution problem in Merlin.

RECOMMENDATIONS

A sewage works programme consisting of the installation of sanitary sewers and the construction of an adequate system for sewage treatment should be initiated for the Police Village of Merlin.

AB:bh

Prepared by

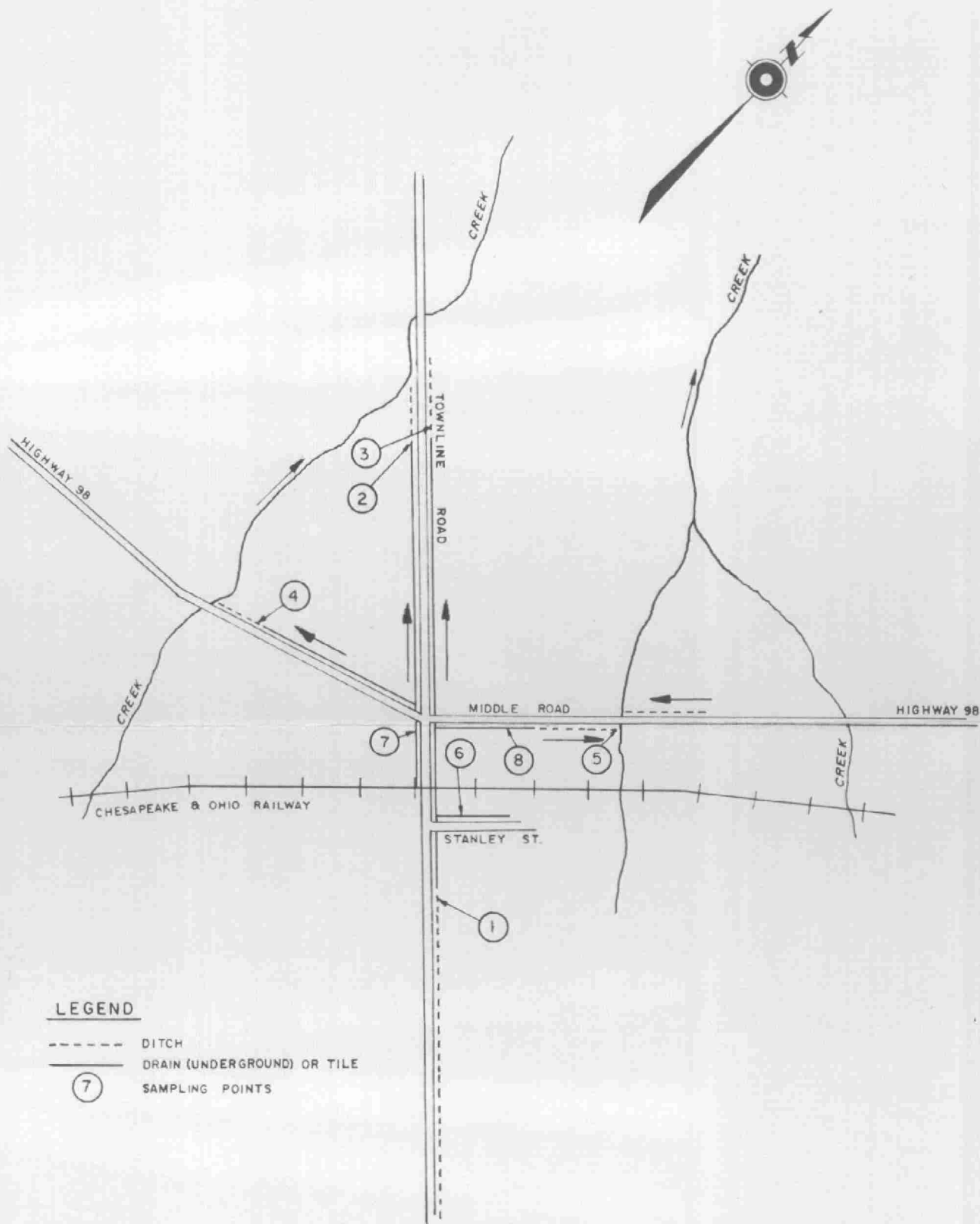
A. Burlachenko  
A. Burlachenko, Technologist,  
Division of Sanitary Engineering.

TABLE IPOLICE VILLAGE OF MERLINWATER POLLUTION SURVEYSURFACE WATER DRAINS

Sampling Point No.	Location	5-Day BOD (ppm)	<u>S O L I D S (ppm)</u>			Anionic Detergents as ABS(ppm)	Coliform Count per 100 ml Membrane Filter
			<u>Total</u>	<u>Susp.</u>	<u>Diss.</u>		
1	Open ditch on Town- line Rd. 0.3 miles South of R.R. Tracks	22	742	72	670	2.0	500,000
2	Open ditch on Town- line Rd. N. (P.V. Limits) W. side of Rd.	258	1122	132	990	26.0	50,000,000
3	Open ditch on Town- line Rd. N. (P.V. Limits) E. side of Rd.	76	968	40	928	24.0	4,000,000
4	Smith Drain along Hwy. #98 West side of Village	10	632	140	492	2.5	850,000
5	Open ditch perpendi- cular to Hwy. #98 - E. side of Merlin	76	1028	74	954	34.0	3,800,000
6	Manhole on Stanley St. N. side about 100ft. East of Townline Rd.	127	884	320	564	4.0	56,000,000

TABLE I (CONTINUED)

Sampling Point No.	Location	5-Day BOD (ppm)	S O L I D S (ppm)			Anionic Detergents as ABS (ppm)	Coliform Count per 100 ml Membrane Filter
			Total	Susp.	Diss.		
7	Manhole - Junction of Townline Rd. & Hwy. #98 S.W. Corner	228	1350	448	902	15.0	350,000
8	Manhole - 1 block E. of Townline Rd. (Hwy. #98 and Sullivan St. S.E. Corner)	94	992	60	932	28.0	3,000,000



ONTARIO WATER RESOURCES COMMISSION

POLICE VILLAGE OF MERLIN  
WATER POLLUTION SURVEY 1967

SCALE: NOT TO SCALE

DRAWN BY: D.M. HARRINGTON

DATE: FEB/1967

CHECKED BY:

DRAWING NO. 68-12